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IS 9228 (1979): Specification for Mono Seat Chairs for Chairlifts Used in Winter Sports [MED 6: Continuous Bulk Conveying, Elevating, Hoisting Aerial Ropeways and Related Equipment]

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“Knowledge is such a treasure which cannot be stolen”

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IS : 9228 - 1979

Indian Standard

(Reaffirmed 2002)

SPECIFICATION FOR MONO SEAT CHAIRS FOR CHAIRLIFTS USED IN WINTER SPORTS

1. Scope

1.1 Covers the requirements for mono seat chairs for passenger chairlifts for winter sports.

1.2 This standard is applicable to chairs used on chairlifts working in anti-clockwise direction, the normal direction of movement of chairlift. In exceptional cases where local conditions require movement of the chairlift in the clockwise direction, the provision laid down in this specification may also be applied with the only difference that the suspension bar of the chairs seen from the front may be to the left of the chair and therefore the form of the bar itself shall be an inversion of 'S'.

1.3 This standard is applicable to chairs for installations, having a speed not exceeding 4·25 m/s and are suitable for areas experiencing temperatures in the following ranges:

a) Up to −30°C, and

b) Below −30°C and up to −60°C.

2. Dimensions — *See* Fig. 1.

3. Material

3.1 For areas experiencing temperatures up to −30°C the suspension bar shall be manufactured from seamless steel tubes having a nominal bore of 40 mm or above of Class Heavy conforming to IS : 1161-1968 'Steel tubes for structural purposes (*second revision*)' or equivalent high tensile tubes. For areas experiencing temperatures below −30°C the material shall be as agreed between the purchaser and the manufacturer.

3.2 The seat of the mono seat chairs shall be manufactured from either suitably treated and seasoned wood or fibreglass-reinforced plastic or foam cushions suitably lined or high strength aluminium alloy.

3.3 Safety bars shall preferably be manufactured from metallic material. Other material like wood, nylon, etc, may be used provided the requirements laid down in **5.2** are satisfied.

4. General Requirements

4.1 When the chair is viewed from the front, the suspension bar shall have a shape of 'S'. The 'S' shape shall permit the free passage of the suspension bar along the line of the ropeway sloping at 90° and in the presence of supporting batteries/rollers/sheaves of standard dimensions when the chair is inclined in the transverse direction at 7° with respect to the vertical and at an inclination of 20° longitudinally.

4.2 The ends of the suspension bar shall be welded with caps so that it is weather tight.

4.3 The suspension bar shall enclose the seating only on the side or on the rear and below the seat.

4.4 The arms of the chair shall have a smooth surface without any projections even for holding the free end of the safety bar of the seat when it is in the locked position.

4.5 Any gap in the seat except in front and sides shall be not more than 25 mm.

4.6 Each chair shall be supplied complete with special connecting piece of the suspension bar with the clamp shown by the fine continuous line in the figure and shall have bearings to permit free swing of 20° longitudinally. The bearings shall be adequately lubricated. There shall be adequate clearance between this and stationary part of the ropeway even in the laterally swung position (*see also* IS : 5228-1969 Code of practice for construction of continuous movement monocable ropeways with fixed grips intended for transportation of passengers).

Conveyors, Vertical Hoists and Bucket Elevators Sectional Committee, EDC 61; Aerial Ropeways Subcommittee, EDC 61 : 5 [Ref : Doc : EDC 61 (3010)]

Adopted 31 July 1979

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MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
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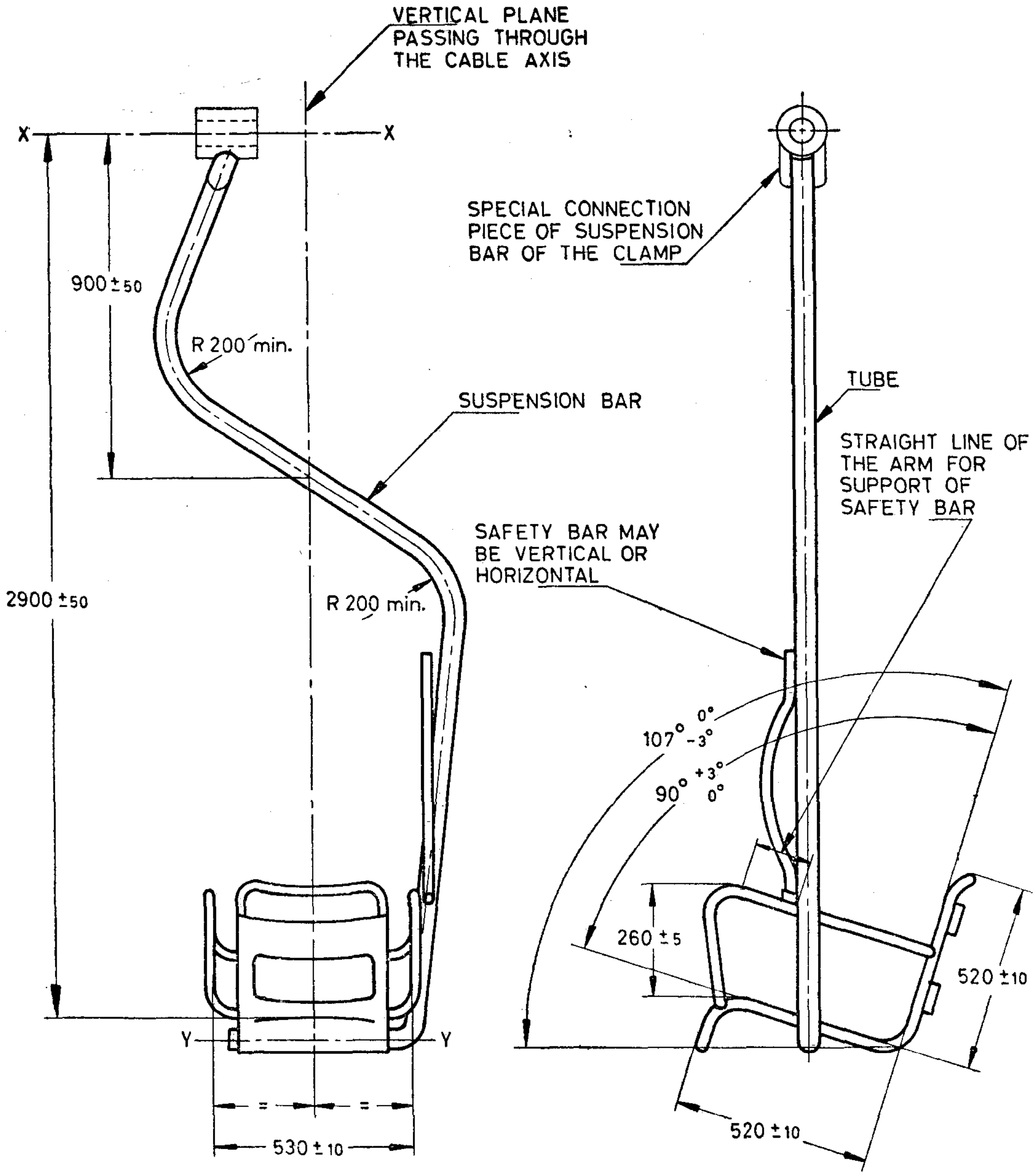
VERTICAL PLANE PASSING THROUGH THE CABLE AXIS
X
X
900 ±50
R 200 min.
SUSPENSION BAR
2900 ±50
R 200 min.
Y
Y
530 ±10
SPECIAL CONNECTION PIECE OF SUSPENSION BAR OF THE CLAMP
TUBE
STRAIGHT LINE OF THE ARM FOR SUPPORT OF SAFETY BAR
SAFETY BAR MAY BE VERTICAL OR HORIZONTAL
107° 0° -3°
90° +3° 0°
260 ±5
520 ±10
520 ±10

All dimensions in millimetres.

Note — The figure illustrates only the dimensions.

FIG. 1 DIMENSIONS FOR MONO SEAT CHAIR FOR CHAIRLIFTS

4.7 The material used for welding shall not fail under sub-zero conditions. The low temperature dc method of welding shall be employed with low temperature electrodes to prevent brittle fracture at sub-zero temperature.

4.8 To avoid failures, there shall be no notches, undercuts, sharp bends and sudden alterations of sections.

4.9 For design purposes, the mass of passengers with complete sportsgear and winter clothing shall be taken as 85 kg/passenger.

5. Tests — Before conducting the tests, the monoseat chairs shall be conditioned as indicated below :

a) At −60°C for two hours for areas experiencing a temperature between −30°C and −60°C or
b) At −30°C for two hours for areas experiencing temperatures up to −30°C.

5.1 *Testing of Suspension Bar, Seat and the Attachment of Seat to the Suspension Bar* — The chair shall be supported by a horizontal bar passing through the bush of the special connecting piece of the suspension bar to the clamp and shall be able to support a test load of 4 kN applied gradually and centrally with respect to the seat, without any appreciable deformation. The deformation is the variation of the distance between the axis of the bush and the axis of the horizontal portion of the suspension bar below the chair (distance between *XX* and *YY* in Fig. 1).

5.1.1 The residual deformation is not considered appreciable if it does not exceed 2 percent of the deformation measured under the test load. The measurements shall be carried out with a suitable gauge.

5.1.2 During the test, the apparent elastic deformation shall be continuous.

5.2 *Testing of Safety Bar*

5.2.1 The safety bar assembly shall be tested in assembled condition with safety bar in closed position. The test shall cover all the joints and locking arrangements in the safety bar assembly. The test shall consist of applying a force of 15 daN in the direction perpendicular to the plane of rotation of safety bar, with safety bar in closed position. During the test no elastic deformation shall be noted when the load applied is held for 5 minutes.

5.2.2 A test similar to **5.2.1** shall be carried out with a load of 30 daN applied on safety bar. There shall not be any permanent deformation of any part of the assembly after the test when the test is repeated ten times in an hour.

5.3 *Crack Detection Test* — All components shall be free from cracks and blow-holes.

6. Marking — Each chair shall be marked with the manufacturer's name or recognized trade-mark, the temperature limitations imposed for the chair and the load for which the chair is suitable.

Note — These markings shall only be marked on the seat and shall not be on any load bearing portion.

6.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

EXPLANATORY NOTE

This standard covers the requirements for mono seat chairs for chairlifts used in winter sports such as skiing and are suitable for use in areas experiencing temperatures ranging either from 0° to —30°C or — 30°C to — 60°C.

This standard is one of the series of the Indian Standards to be formulated on aerial ropeways. Other standards published so far in the series are given below:

IS : 5228-1969 Code of practice for construction of continuous movement monocable ropeways with fixed grips intended for transportation of passengers

IS : 5229-1969 Code of practice for construction of continuous movement monocable ropeways with automatic grips intended for transportation of passengers

IS : 5230-1969 Code of practice for construction of continuous to-and-fro movement bicable ropeways intended for transportation of passengers

IS : 7649-1974 Glossary of terms used in connections with aerial ropeways and cableways

IS : 9047 (Part I)-1978 Data sheet for aerial ropeways and cableways : Part I Data to be supplied by intending purchaser for aerial system for transportation of goods

In the preparation of this standard considerable assistance has been derived from UNI 6452-1969 "Funicolari aeree — Seggiola monoposto per seggiovie — Dimensioni caratteristiche e prove" (Aerial cableways — Monoseat chair for chairlifts — Dimensions, characteristics and tests) issued by Ente Nazionale Italiano Di Unificazione, Milano.

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